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OUTLOOK FOR HOPS
FROM THE PACIFIC COAST

Washington 25, D. C.
November 1948

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NOTE

The study on which this report is based was undertaken at the request of the United States Hop Growers Association. The present report brings up to date the "Outlook for Hops," issued in 1946 by the Bureau of Agricultural Economics of the U. S. Department of Agriculture and the Agricultural Experiment Stations of California, Oregon, and Washington.

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SUMMARY

Relating to Production

1. There is considerable fluctuation in the acreage of hops harvested each year. The acreage harvested in the pre-prohibition year of 1916 was 38,900; in 1923, during prohibition, the acreage had dropped to 18,440 acres. Subsequently the trend of harvestings has been upward, having reached a peak of 40,600 acres in 1945, with only minor downward adjustments for 1946, 1947, and 1948.

2. Growers can affect the output of hops for one season without permanently removing the yards from production. Some growers will let their yards lie idle for a season; others will not harvest their crop because of unfavorable prices at harvest time.

3. New plantings of hops have occurred in each of the three commercially significant producing States -- Oregon, Washington, and California. The highest percentage increase in acreage was in Washington where acreage yields are highest. Furthermore, Washington produced more hops during 1945 through 1948 than either Oregon or California. In addition, approximately two thirds of Washington's output is of very low seed content.

4. The low hop yields per acre in Oregon reflect the use of poorer soil, a lack of irrigation, and losses from disease and insects. On those farms with low yields and high unit production costs, any lowering of hop prices will be especially influential in regard to future operations.

5. Mechanization of the harvesting operations in the industry is proceeding without undue disturbance in the labor balance in the hop-producing areas. If a complete mechanization of picking operations is effected, it will mean a higher capital investment in yards and equipment and a higher overhead expense for the operators, although the unit cost for picking might be reduced.

6. Further increases in fixed overhead, caused by higher capital investments, will affect materially the decision of operators to harvest or not to harvest their annual crops. As a factor in the supply, the mechanization of harvesting and resulting increase in fixed overhead charges would tend to promote a rather high level of harvesting in yards where such a condition exists.

7. Wartime prices were sufficiently high to induce old growers to expand their acreage and new growers to plant hops. The full effects of the new plantings were not felt until 1946. It is conceivable although not likely that an output of more than 60 million pounds of hops can be produced domestically, provided the total hops acreage is harvested and plant diseases and pests are kept to a minimum. Such a production would exceed the record 1945 output of 56.8 million pounds by about 3.2 million pounds. As farmers are not limited by a supply of suitable land for planting hops, their response to a favorable price situation is always a potential market factor.

Relating to Consumption

1. Approximately 98 percent of all hops grown in the United States are used in the manufacture of beer and ale.

2. Beer consumption in the United States increased by more than 100 percent between 1935 and 1948, but the consumption of hops in the manufacture of beer increased about 33 percent. This disproportionate increase of the manufacture of beer in relation to hops used in its manufacture was due to a change in the hops-beer ratio from 0.702 pound of hops per barrel of beer to 0.455 pound in 1947-48.

3. Available information indicates a present consumer preference for beer with a low hop content. During the war, the hop content of beer was reduced somewhat because of the shortage of malt and it has remained low because of consumer preference.

4. The probable upper limit of beer manufacture, at the most likely hops-beer ratio, would require considerably fewer hops than were produced in 1948. Even if the hops-beer ratio should reach 0.5 pound of hops per barrel of beer, the amount of hops required to produce 90 million barrels would be 7 million pounds below the record 1945 hops production of 56.8 million pounds.

5. Consumption of beer increased approximately 6 gallons per capita, or from approximately 13 to approximately 19 gallons per capita, between 1940 and 1945 and has remained near 18 gallons per capita since 1945. There is reason to believe that per capita beer consumption is likely to decline with any material decrease in consumer purchasing power.

6. The conclusion of the authors is that the probable consumption of beer will not be sufficient to absorb in domestic markets the potential output of domestic hops. On the other hand, there have been only a few years since 1900 that we have not had a net export balance.

Relating to Foreign Trade

1. Any forecast relative to the foreign demand for American hops beyond the next 2 or 3 years is hazardous. Hops were exported in larger volume than expected, between 1945 and 1948, because of the slowness of European recovery. Assuming a continued improvement of grain supplies in Europe and a resulting increase in beer production, United States hop imports may not exceed current levels for the next 2 or 3 years. This condition would result in a net export balance for that time.

Relating to Hop Prices

1. Any maladjustment of the supply and demand for hops is reflected in the carry-over. As the demand of the breweries for hops is only slightly elastic from the standpoint of varying the hops-beer ratio in response to price changes, any abnormal inventory results in a weakening of the growers' bargaining position and in lower prices. There is some indication, however, that a demand for storage will arise if there should be a material decrease in the prices of hops. At this time, inventories in the hands of brewers have been rebuilt to near-normal levels. This is highly significant in a pricing situation.

2. Growers tend to leave some of their hops unharvested if contract prices are not satisfactory. In this way they exercise some measure of control over the carry-over for the following year.

3. Unless there is an abnormal increase in the consumption of beer, or an unusually high net export trade in hops, or a material increase in the hops-beer ratio, or a crop failure, the probable annual supply of hops after 1948 will probably exceed the annual demand by several million pounds.

4. Hop growers will face some real problems after 1948. It is likely that prices will not prove satisfactory to growers because of the serious unbalance between prospective demand and prospective supply. This prospective maladjustment between supply and demand should be of special concern to hop growers.

5. Reliable information, if made available currently, promotes a greater degree of price stability in the hops market.

6. The development of uniform standards for grading hops, which has been in progress at Oregon State College, and putting them into use, should do much to eliminate some of the unaccountable price variations that have occurred in the past. Grading by such standards would be of material assistance in stabilizing market conditions.

OUTLOOK FOR HOPS
FROM THE PACIFIC COAST 1/

by D. B. DeLoach

PRODUCTION OF HOPS IN THE UNITED STATES

Hop production has moved westward over the last 50 years. New York was the leading hop-producing State in 1899; it had half of the total acreage (table 1). By 1909, acreage there had declined by half; and by 1919, New York was no longer a major hop-producing State. On the Pacific coast, Oregon has been the leading State most of the time. The relative position of Oregon first, California second, and Washington third, in acreage, has existed throughout, with only minor exceptions.

Acreage

The year-to-year changes in acreage are more revealing, especially for recent years (fig. 1 and table 7). In the period preceding World War I, hop acreage was fairly steady for several years at 40,000 to 45,000 acres. A sharp decline occurred in 1917, and from 1917 to 1932 acreage varied from 18,000 to 27,000. The sharp decline in 1917 was nearly 2 years ahead of national prohibition. Several States had previously passed "local option" laws prohibiting the sale of alcoholic beverages, which undoubtedly reduced the demand for hops. The probability of national prohibition may have been one cause of the reduction of acreage before the actual initiation of the Eighteenth Amendment to the Constitution.

Acreage of hops harvested rose sharply in 1933 and again in 1934, which probably means that plantings were made in 1933. This increase in acreage somewhat anticipated the removal of beer from the intoxicating-beverage class, which occurred in March 1933, and the later repeal of the prohibition law in December 1933. Harvested hop acreage reached a peak of 39,100 acres in 1935. During the 1936-43 period, the acreage of hops harvested ranged between 31,000 to 35,000 acres. Harvested acreage rose to 40,700 in both 1945 and 1946, and it declined only slightly in 1947 and 1948. The year-to-year changes in acreage suggest the possibility of cycles of over- and under-planting. There is an indication however, that producers are decreasing acreages slightly in Oregon and increasing in the irrigated areas around Yakima, Washington.

1/ Revisions and re-analysis were made by D. B. DeLoach, now Consultant to the Chief, Bureau of Agricultural Economics. The original Bureau of Agricultural Economics report, "Outlook for Hops," issued in March 1946, was prepared jointly by D. B. DeLoach and Marion Clawson (now Director, Bureau of Land Management, Department of the Interior).

Table 1. - Acreage of hops in leading States in the United States, census years from 1899 and for 1948 ^{1/}

Year	Oregon	Washington	California	New York	Idaho	All other States	United States
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1899	15,433	5,296	6,890	27,532	-	462	55,613
1909	21,770	2,433	8,391	12,023	-	76	44,693
1919	5,629	1,129	8,118	1,024	-	54	15,954
1929	16,327	2,814	4,144	17	-	-	23,302
1939	18,649	4,665	6,354	185	-	96	29,949
1948 ^{2/} ..	17,700	13,100	9,200	200	600	-	40,800

^{1/} For estimates of acreage harvested annually, see table 7.

^{2/} Preliminary.

Sources: 1899 - Twelfth Census of the United States, Vol. VI, Part II, p. 594;
 1909 - Thirteenth Census of the United States, Vol. V, p. 699;
 1919 - Fourteenth Census of the United States, Vol. V, p. 850;
 1929 - Fifteenth Census of the United States, Agriculture, Vol. IV, p. 824;
 1939 - Sixteenth Census of the United States, Agriculture Vol. III, p. 795.

Yield

Hop yields vary considerably from year to year (fig. 2). Average yields per acre are highest in Washington, next highest in California, and much lower in Oregon (tables 2 and 8). Moreover, the trend in yields has been different in the three States. Average acre yields in Washington for the 1905-09 period were 1,384 pounds; yield rose to more than 2,000 pounds per acre in 4 out of the 6 years from 1923 to 1928, inclusive. These were years of relatively small acreage, and the poorer yards probably went completely out of production in those years. Since 1930, yields per acre have been rising irregularly. For the entire 1905-45 period, yields in Washington were increasing about 14 pounds annually. In contrast, yields per acre in Oregon have declined rather steadily since 1925; crop specialists say this is caused by the spread of plant diseases and insects. Yields were particularly low in 1917 and 1918, when acreage was shrinking very fast. Acreage rose during the mid-1920's. For the entire period, yields per acre declined only about 2 pounds per year, but for the period since 1925 average yields per acre have declined almost 300 pounds. If this downward trend continues, its effects on income are bound to be serious to many producers. There has been a slight increase in average yields in California, an area which suffered greatly from mildew during 1948. This condition reduced the acreage harvested as well as the yield per acre.

These differences in average yields per acre, and particularly the differences in trend of yields, may be a major cause of the differences in rate of new plantings of hops.

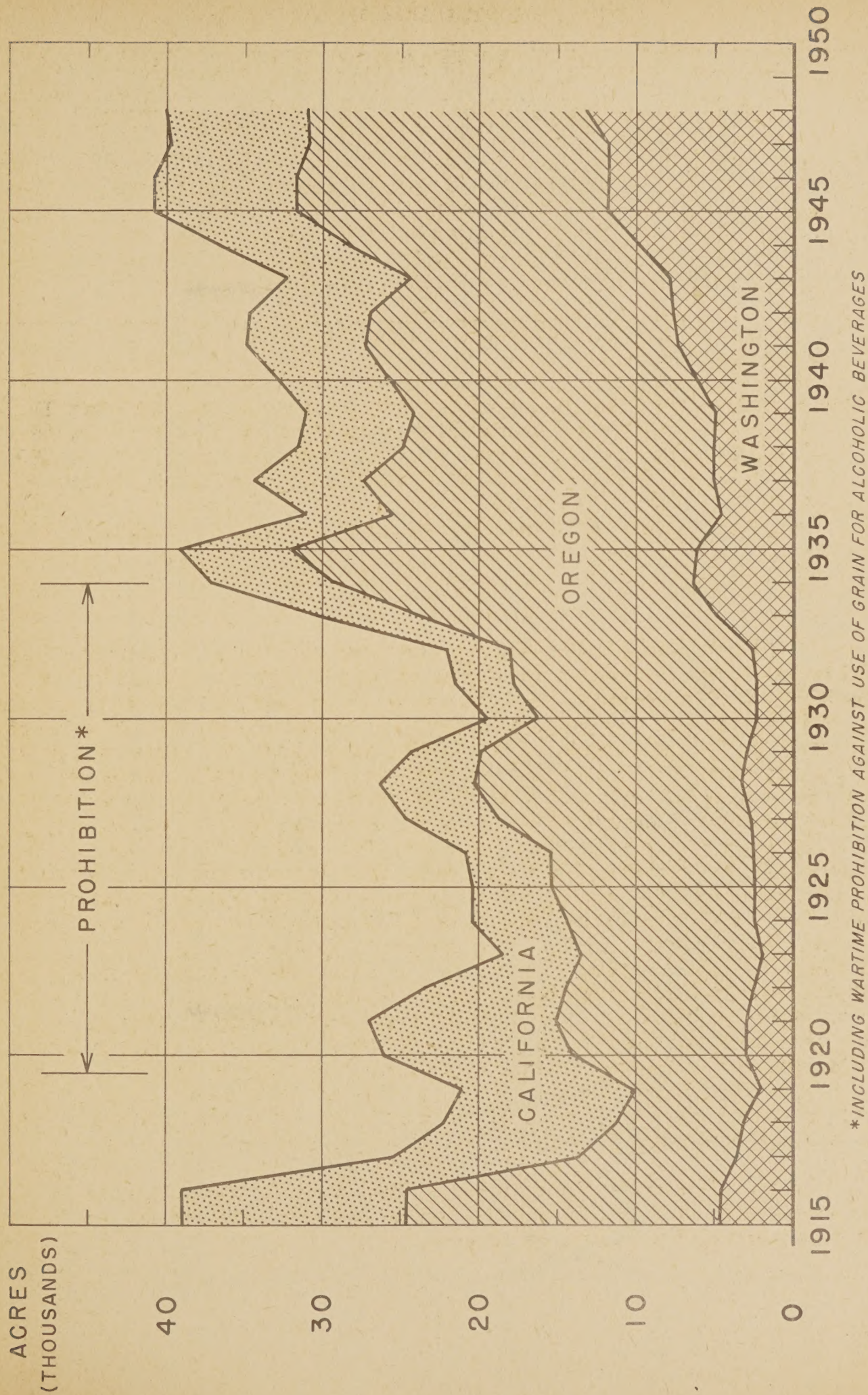


FIGURE 1.- ACREAGE OF HOPS HARVESTED, BY STATES, 1915-48

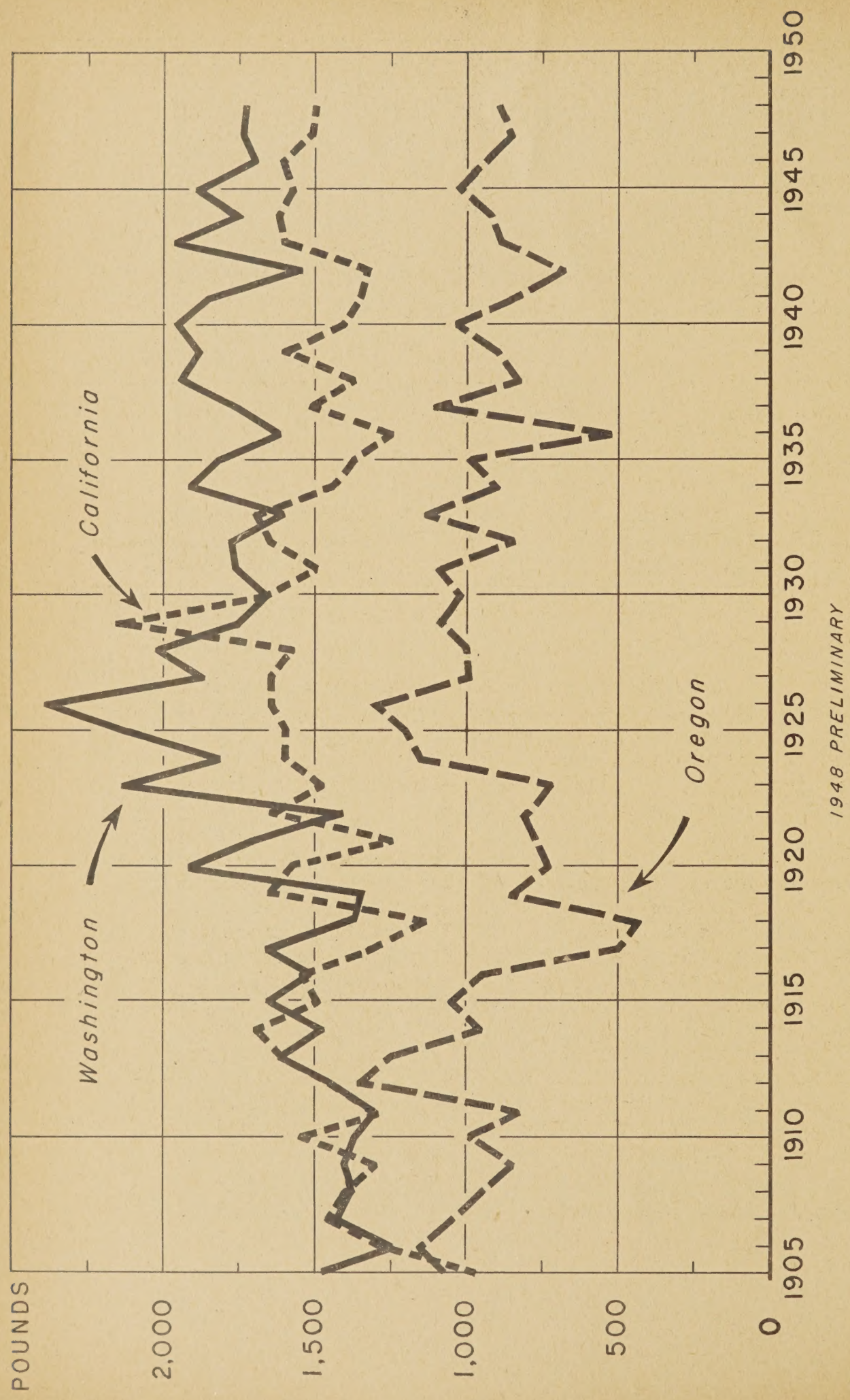


FIGURE 2.- YIELD OF HOPS PER ACRE, BY STATES, 1905 - 48

Table 2. - Average yield of hops per acre, by 5-year periods, and by States, 1905-09 to 1945-48

Period	Average yield per acre in		
	Washington	Oregon	California
	Pounds	Pounds	Pounds
1905-09	1,384	1,014	1,281
1910-14	1,443	1,073	1,520
1915-19	1,506	757	1,430
1920-24	1,792	833	1,509
1925-29	2,027	1,116	1,726
1930-34	1,740	929	1,588
1935-39	1,802	870	1,422
1940-44	1,812	872	1,460
1945-48	1,770	926	1,482

Source: Based on data in table 9.

Total Production

Total production of hops is the resultant of changes in acreage and of changes in yields. Before World War I, hop production in the United States averaged over 50 million pounds annually (table 3 and fig. 3). During the prohibition period, it declined to little more than half of this quantity. In part, this decline was due to the virtual disappearance of New York as a commercial producing area.

There has been a considerable year-to-year variation in production (fig. 4 and table 9). There are occasional years of unusually high production. More important, from the viewpoint of the brewing industry, are the years when production is unusually low. As long as years of low production may occur, the industry needs to maintain substantial stocks in order to avoid a shortage of suitable hops.

Because of a combination of expanding acreage and fairly good yields, production increased by about 5 million pounds each year from 1942 to 1945. In the latter year, production was higher than in any year since 1913, and was at the general level prevailing before World War I. Acreage now is lower than in the former period, but acre yields are somewhat higher, so the total production is about the same. Hops planted in the last year or 2 are not yet in full bearing, so production from the present acreage has probably not reached its maximum. If additional plantings are made in the next year or 2, and if proper cropping practices are used to improve yields, total production of hops could reach a new high. It is not anticipated, however, that the total production would exceed that of 1945, as there is a tendency for the total acreage to stabilize near the present level.

Table 3.- Average annual production of hops, by 5-year periods, and by States, 1905-09 to 1945-48

Period	Average annual production in				Total
	Washington:	Oregon	California	Other	
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.
1905-09....	6.3	20.0	14.0	9.5	1/ 53.6
1910-14....	2/	2/	2/	2/	52.2
1915-19....	5.4	11.1	18.0	2.1	36.6
1920-24....	4.5	9.8	13.1	3/	27.6
1925-29....	5.4	16.8	9.2	4/	31.4
1930-34....	6.4	17.3	7.9	4/	31.6
1935-39....	9.2	19.0	9.5	4/	37.7
1940-44....	13.8	16.4	11.3	4/	41.5
1945-48....	21.2	17.8	13.5	4/	52.5

1/ This figure obtained from later sources than State figures, and does not check exactly.

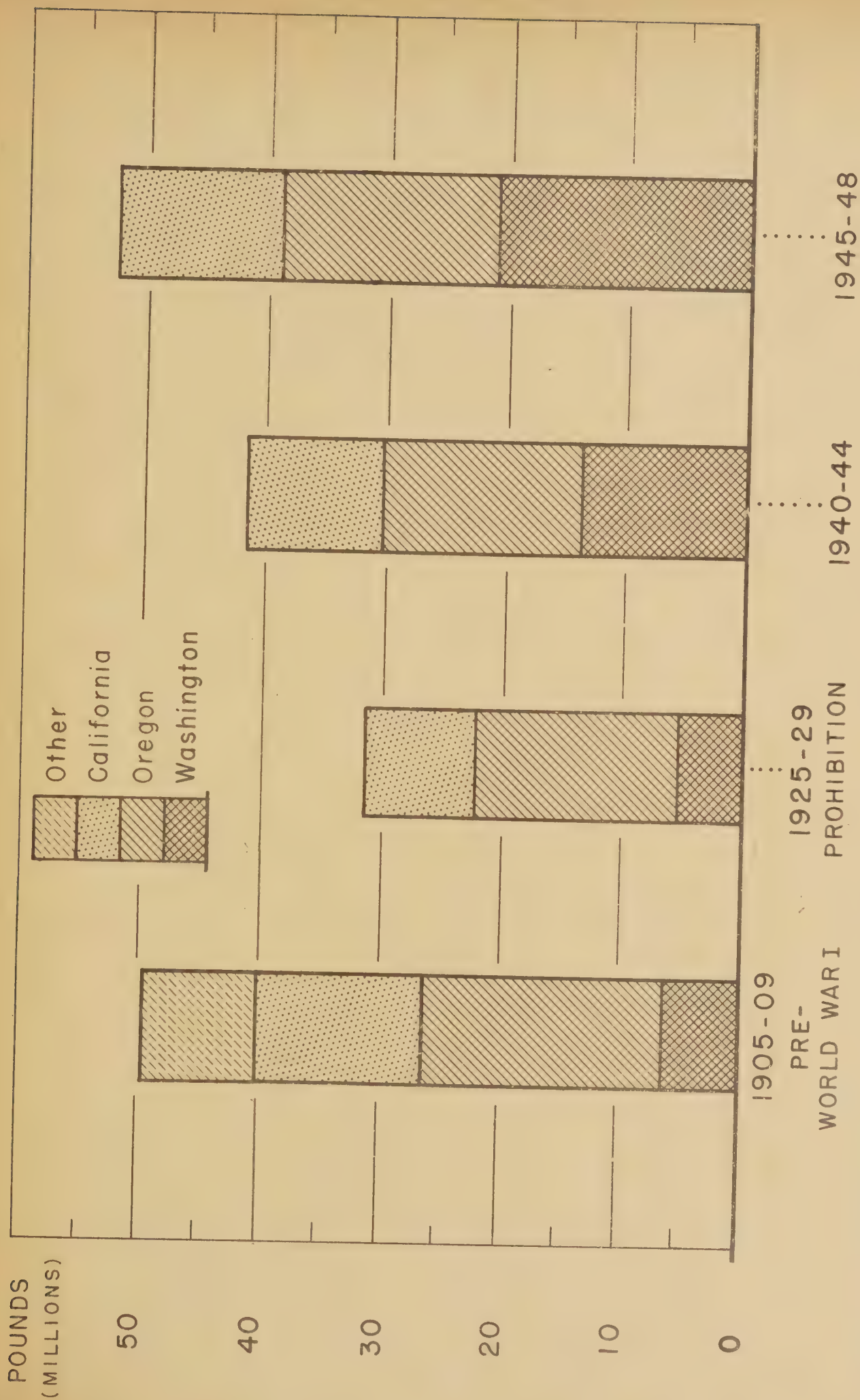
2/ Data not available by States.

3/ Data available only for 1920; total does not check exactly because it includes production in other States for 1920.

4/ Data not available.

Sources: See table 8.

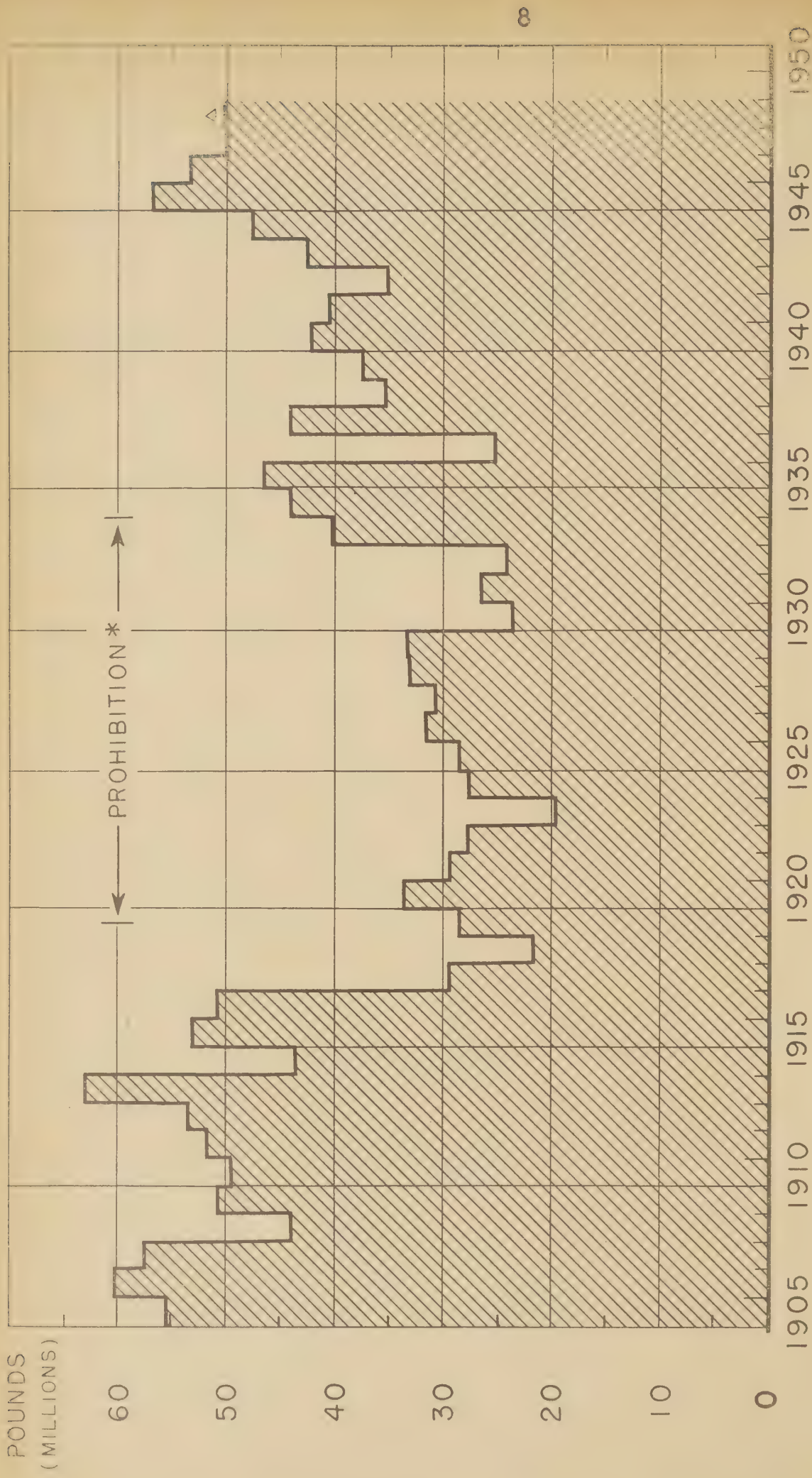
Hop-picking machines are not new, but they have been used more extensively since 1940 than previously. Field as well as stationary machines have been used. Machines probably lower the cost of picking, but data on average costs by hand and by machine are not available. Another factor to consider is the effect of machine-picking upon yield and quality of hops, but information is not available on these points. Hops picked by hand and by machine during the war contained more stems and leaves than normally, because laborers were unwilling to pick clean under fixed picking rates. This may have had an effect upon the prices for hops. A fuller mechanization of harvesting operations will increase the capital investment in equipment and yards, thereby raising fixed costs to a point where they will induce some operators to continue producing and picking hops in order to cover their fixed charges and minimize their losses.



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**FIGURE 3.- AVERAGE ANNUAL HOP PRODUCTION FOR
SELECTED PERIODS, BY STATES**



* INCLUDING WARTIME PROHIBITION AGAINST USE OF GRAIN FOR ALCOHOLIC BEVERAGES

Δ AS INDICATED

FIGURE 4.- ANNUAL PRODUCTION OF HOPS IN THE UNITED STATES, 1905-48

Outlook for Production

A 26-percent increase in acreage of hops harvested, from 1943 to 1945, has been noted. As nearly as can be ascertained, there was practically no abandonment of hop yards during these years. The increase in harvested acreage in 1944, 1945, and 1946, therefore, largely reflects new plantings in 1943, 1944, and 1945. Few, if any, hop plantings have been made since 1946. The prices of hops during the postwar years have been relatively favorable to producers. The average farm price for 1935-39 was 19.5 cents per pound, dried basis; in 1942 it was 45.2 cents, or 132 percent above 1935-39; in 1943, 62.2 cents, or 219 percent above 1935-39; in 1944, 64.6 cents, or 231 percent above 1935-39; in 1947, 67.9 cents, or 246 percent above 1935-39. Costs had risen during these years. However, the national index of prices paid by farmers for all commodities, including interest and taxes, rose from the 1935-39 average by only 17 percent in 1942, 27 percent in 1943, 32 percent in 1944, 34 percent in 1945, 51 percent in 1946, and 80 percent in 1947. On the other hand, farm wages without board for the Pacific coast had risen from the 1935-39 average by 77 percent in 1942, 137 percent in 1943, 171 percent in 1944; 190 percent in 1945; 198 percent in 1946, and 206 percent in 1947. Hops require more farm labor than many farm products, but considering all available facts it appears that hop production in these years was relatively profitable, which is probably a major reason for the expansion in acreage which took place.

Another major cause of this increase was the extensive wartime use of 2- and 3-year contracts. On April 1, 1945 contracts with growers covered more than 35 million pounds, or 65 percent of the production that year. An approximately equal volume was under contract on this date, for delivery in 1946, and substantial tonnage was also contracted for delivery in 1947 and 1948. These contracts had various provisions about prices. In general, it was specified that prices paid would not exceed any price ceilings that might be established by the Government. Subject to that limitation, prices for 1945 delivery averaged about 65 cents per pound; for 1946 delivery, about 55 cents; and for 1947 delivery, about 45 cents. The lower prices in the later years were based on the assumption that production costs would decline after the war. With the prospect for profitable prices which these contracts offered, a grower might establish a yard and recover a good share of his investment within a year or two. Subsequent events brought about prices for hops in 1946, 1947, and 1948, that were much higher than the growers expected when they made these future contracts.

The 8,400-acre increase in harvested acreage from 1943 through 1945 was due to plantings in 1943, 1944, and 1945. As pointed out, a large part (46 percent of the increase in acreage from 1943 to 1945) of the increased acreage is in Washington, where acre yields are highest. With the higher yields and upward trend in yields in that State, and a possible increase in acreage yields in Oregon, due to irrigation and the control of disease and insects, average acre yields of hops for the whole region could increase as much as 5 percent in the next 3 years, as contrasted with yields in the 1945-48 period.

Another potential force that might cause a further unbalancing of hops supply and demand is the fact that there is a large acreage of land in the United States that is suitably located for the production of this crop. For this reason the price of hops in relation to the price of other crops, rather than the limitation of land, becomes one of the principal factors determining the extent of grower plantings.

There are obviously some uncertainties as to future hop production, but it seems fairly clear that production will be very large in comparison with that since the repeal of the prohibition law. The possible outlets of such production, either through domestic consumption or through export, are considered in the following sections of this report.

CONSUMPTION OF HOPS

Approximately 98 percent of the hops consumed in the United States normally are used in making beer and ale, and 2 percent are sold to the bakery trade and for the manufacture of pharmaceutical products. Since a major part of the crop is used in the preparation of an alcoholic beverage that is subject to a Federal excise tax, the statistics assembled by the Bureau of Internal Revenue for administration purposes constitute a fairly reliable source of information on the consumption of hops.

The consumption by breweries is shown in table 10. The relatively heavy consumption by breweries before 1917 is explained by the high hops-beer ratio rather than by an exceptionally high per capita consumption of beer. Beer manufacturers anticipated a resumption of former habits with the repeal of prohibition, and began to manufacture and sell beer containing 0.702 pound of hops per barrel. It became obvious that the tastes of the new generation of consumers were different from those of the pre-prohibition consumers. The adjustments that took place to satisfy the new kind of consumer demand are reflected in table 4.

Table 4.- Beer production, hop consumption by breweries
and ratio of hops to beer, 1934-35 to 1947-48

Year July 1 to June 30	Production 1/ Barrels - 31 gal.	Hop and hop extract used Pounds	Pounds per barrel Pounds
1934-35	45,228,605	31,772,887	0.702
1935-36	51,812,062	34,516,246	.666
1936-37	58,748,087	37,004,749	.629
1937-38	56,340,163	34,874,575	.619
1938-39	53,870,553	32,462,163	.6026
1939-40	54,891,737	31,926,866	.5816
1940-41	55,213,850	31,154,676	.5643
1941-42	63,649,483	34,509,072	.542
1942-43	71,018,257	34,701,474	.488
1943-44	81,651,469	36,137,992	.4426
1944-45	86,604,080	37,085,050	.428
1945-46	84,890,273	37,407,803	.441
1946-47	87,856,902	40,506,913	.461
1947-48	91,217,201	41,542,662	.455

1/ Total beer production; later tables use beer consumption based upon tax-paid withdrawals of beer.

Source: Hop Control Board Reports.
United States Hop Growers Association.

Beer consumption more than doubled between 1934-35 and 1947-48, but brewers used only 30.7 percent more hops to manufacture beer in the latter period. In other words, where 1 barrel of beer required an average of 0.702 pound of hops in 1934-35, only 0.455 pound was used in 1947-48. This reduction might have been due in part to the need of maintaining a balance between hops and malt, as the supply of malt was inadequate during the war. Available statistics show that the hopping ratio has declined annually on an average 0.02 pound of hops per barrel of beer, for the years 1936-42 inclusive. The rate of decline for 1941-45 inclusive was in excess of this average. There is reason to believe, however, that the stabilization will occur at a level in excess of that of 1944-45.

Most brewers are inclined to believe that the consumer preference for the so-called light beers will continue in the postwar era. As conditions now exist, this would mean a hops-beer ratio of 0.5 pound, or less, of hops to a barrel of beer. Present practices in the industry are such that some brewers are using as low as 0.3 pound of hops to a barrel of beer, which would indicate that an acceptable beer can be made with a lower average hopping ratio than that now obtaining in the industry. Some indication of the quantity of hops required to manufacture various quantities of beer with assumed hops-beer ratios is found in table 5 and figure 5.

Table 5.- Estimated annual consumption of hops at various levels of beer production and various hop-beer ratios

Assumed :		Assumed ratio: pounds of hops per barrel of beer								
beer	:	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.50
production:	:	:	:	:	:	:	:	:	:	:
Million :	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	Mil.	
barrels 1/ :	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
50	:	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0
55	:	23.1	23.7	24.2	24.8	25.3	25.9	26.4	27.0	27.5
60	:	25.2	25.8	26.4	27.0	27.6	28.2	28.8	29.4	30.0
65	:	27.3	28.0	28.6	29.3	29.9	30.6	31.2	31.9	32.5
70	:	29.4	30.1	30.8	31.5	32.2	32.9	33.6	34.3	35.0
75	:	31.5	32.3	33.0	33.8	34.5	35.3	36.0	36.8	37.5
80	:	33.6	34.4	35.2	36.0	36.8	37.6	38.4	39.2	40.0
85	:	35.7	36.6	37.4	38.3	39.1	40.0	40.8	41.7	42.5
90	:	37.8	38.7	39.6	40.5	41.4	42.3	43.2	44.1	45.0
95	:	39.9	40.9	41.8	42.8	43.7	44.7	45.6	46.6	47.5
100	:	42.0	43.0	44.0	45.0	46.0	47.0	48.0	49.0	50.0
1/ 1 barrel = 31 gallons.										

As shown in table 6, beer consumption increased from 8 gallons per capita in 1934 (the year following repeal of the prohibition amendment) to about 13 gallons in 1937, and remained rather stable at 12 to 13 gallons per capita from 1938 to 1941. During the next 4 years, consumption increased by more than 50 percent to about 19 gallons per capita. Since 1945, beer consumption has been around 18 gallons per capita. The total consumption of beer in the United States was rather closely related to disposable income of consumers during the 1936-42 period. This is another way of saying that sales of beer are highest when the most workers are employed and earning good wages. This is also true for soft-drink beverages. During the war, consumption of beer rose more than the higher incomes alone would suggest. The shortage of consumer goods undoubtedly tended to favor the consumption of beer. The shortage of whisky, wine, and similar liquors, may be particularly influential in this connection.

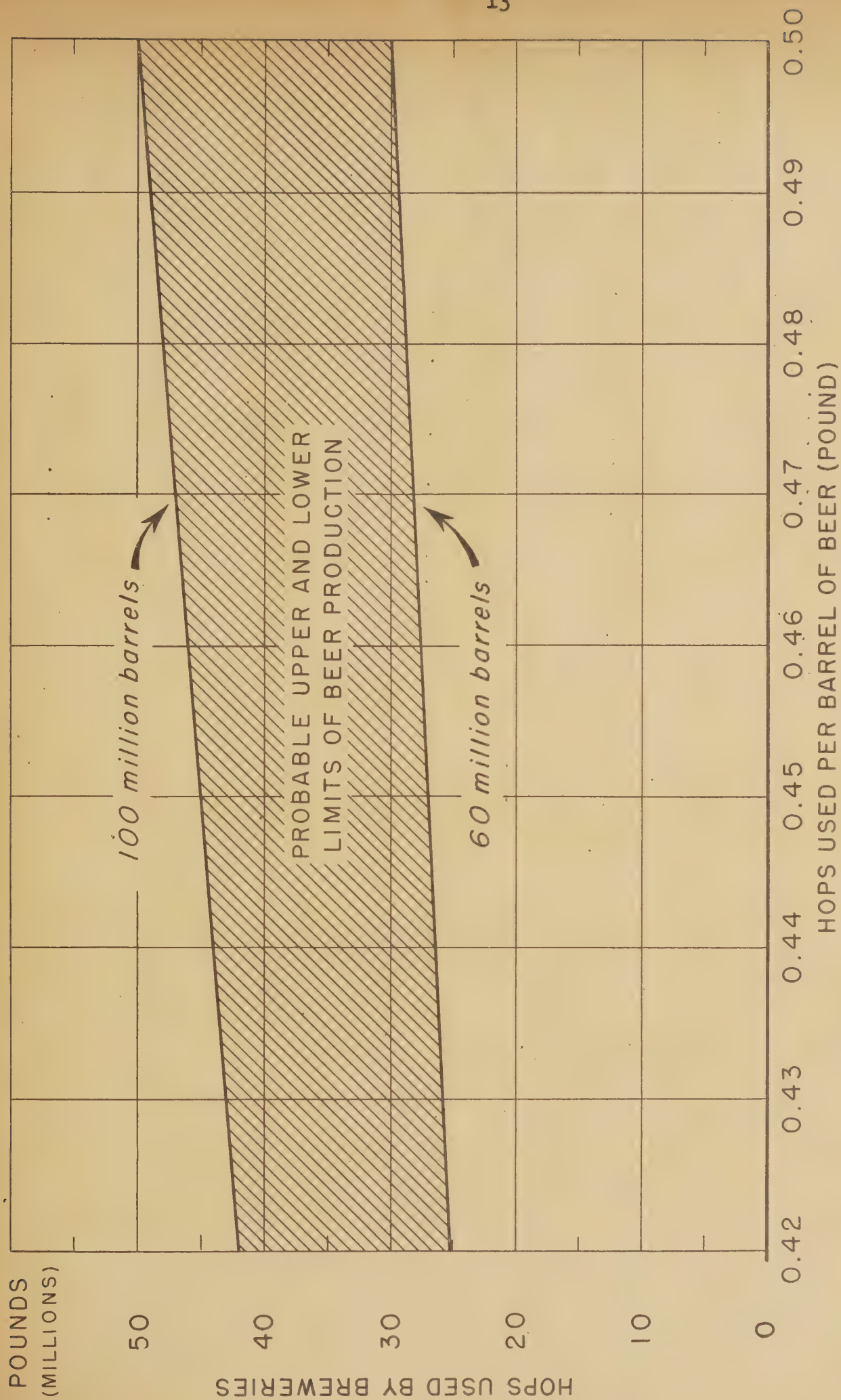


FIGURE 5.- HOPS CONSUMPTION RELATED TO HOPS-BEER RATIO
AT VARIOUS LEVELS OF BEER PRODUCTION

Table 6.- Tax payments on malt beverages, and population, consumption, and national income

Fiscal year	Tax paid : withdrawals of : fermented malt : beverages <u>1/</u> :	Population : January 1 : <u>2/</u> :	Consumption : per capita : <u>3/</u> :	National income : <u>4/</u> :
	1,000 barrels	Thousands	Gallons	Billion dollars
1934	32,266	126,011	7.94	49.5
1935	42,229	126,865	10.32	55.7
1936	48,760	127,720	11.83	64.9
1937	55,392	128,475	13.37	71.5
1938	53,926	129,355	12.92	64.2
1939	51,817	130,406	12.32	70.9
1940	53,014	131,456	12.50	77.6
1941	52,799	132,561	12.35	96.9
1942	60,856	133,688	14.11	122.2
1943	68,636	134,042	15.87	149.4
1944	76,970	133,580	17.86	160.7
1945	79,591	131,664	18.74	161.0
1946	81,287	<u>5/</u> 139,899	18.01	165.0
1947	82,629	<u>5/</u> 143,414	17.86	202.5
1948	86,993	<u>5/</u> 146,114	18.45	---

1/ Barrels of 31 gallons. Source: Bureau of Internal Revenue.

2/ Excluding members of the armed forces overseas. Source: Census.

3/ Beer shipped to the armed forces overseas is not included in tax-paid withdrawals so the population series has been adjusted accordingly.

4/ Calendar years. Reported in Survey of Current Business: 1934-41, in Apr. 1944; 1942-43, in Feb. 1945; 1944-45, in Sept. 1945; 1946, in 1947 Agricultural Statistics; 1947-48, in Sept. 1948.

5/ Estimates on July 1. Do not include armed forces overseas.

The permanency of the wartime increase in the consumption of beer will depend on the amount of income consumers have, the competition from other goods, and the degree to which the wartime changes in eating and drinking habits will have a permanent effect. Shortages of consumer goods relative to demand can be expected to disappear as civilian production increases and backed-up demands are satisfied. If consumers' incomes stayed at the 1944-45 level, total beer consumption would be at least 70 million barrels on the basis of 1936-42 relations between beer consumption and consumer income. In addition, any wartime changes in consumer tastes would increase the demand for beer. If disposable income should fall to the 1941 level, beer consumption would be lower; if consumers' disposable incomes rise, consumption would be higher. This is the basis for the selection of 60 to 100 million barrels as the probable range of beer consumption after the war - from 13 to 20 gallons per capita (fig. 5).

Beer consumption and the hops-beer ratio determine almost wholly the domestic consumption of hops. Even under maximum assumptions as to these factors, domestic consumption can be expected to fall considerably below domestic production.

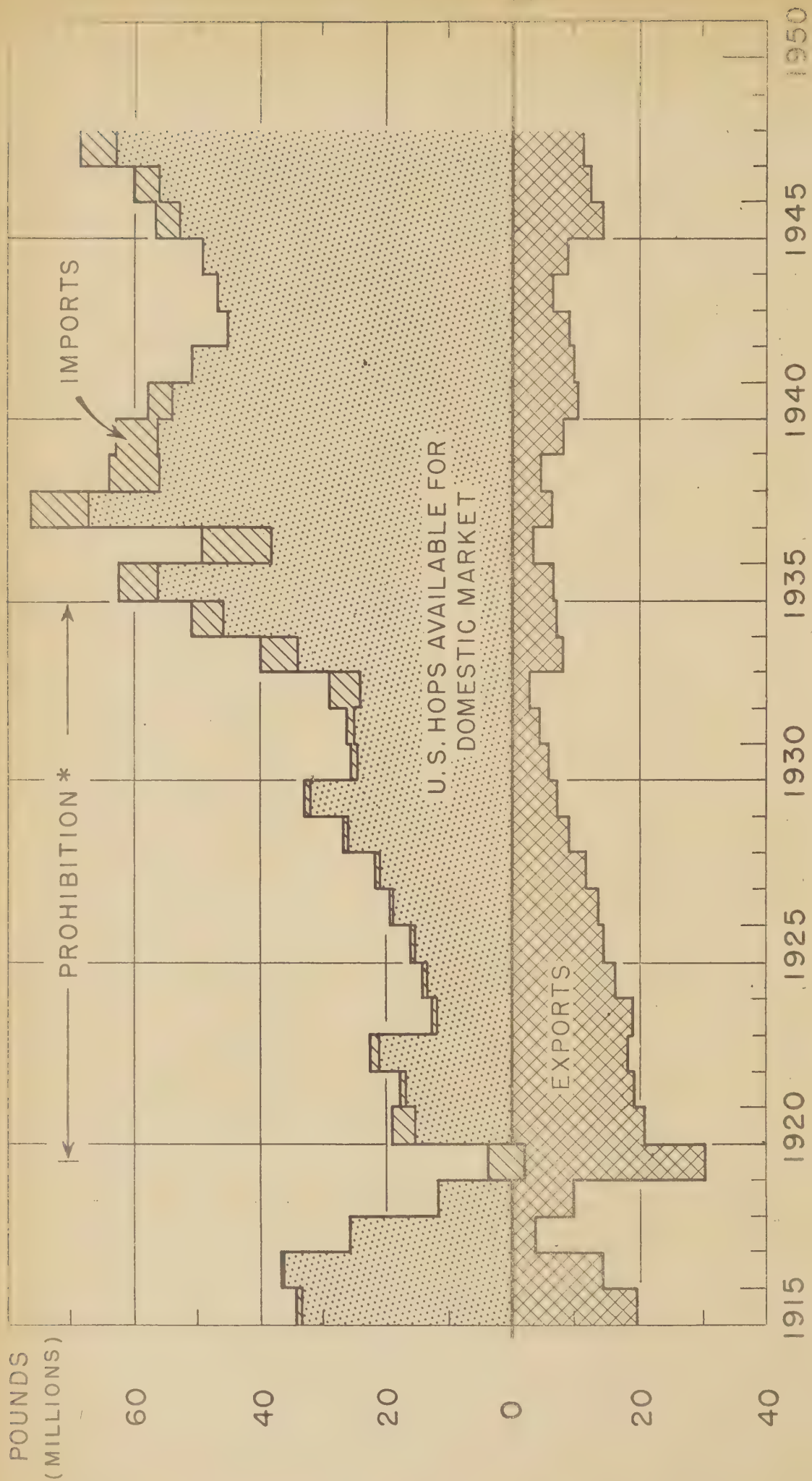
The market objective of the brewery industry is around 100 million barrels of beer annually. ^{2/} If this goal should be reached and if a 0.5 pound hops-beer ratio obtains, the domestic demand for hops would almost equal the estimated domestic production of hops for 1945; but would fall short of the anticipated production after 1948. Any lower consumption of beer or any lower hops-beer ratio would mean that a production equal to that of 1948 would not be absorbed by the market demand and any increased production would be still further in excess of demand. This fact was emphasized rather clearly by the 1948 output which was about 9 million pounds more than current domestic needs (table 5 and figure 5). It must be recognized, moreover, that during the prewar, post-prohibition years, 1934 to 1940, the annual consumption of imported hops by domestic breweries ranged between 16 and 30 percent of the annual total consumed by breweries. There may readily be a resumption of a substantial demand for foreign-grown hops. This is especially true unless domestic growers raise the quality of their product enough to equal the standards maintained by most imported hops.

FOREIGN TRADE IN HOPS

Hops are both exported from and imported into the United States. Before World War I, exports were roughly one fourth of our domestic production and were more than double our imports (fig. 6). When the prohibition law cut the domestic consumption of hops, exports absorbed the major part of a diminished production, particularly from 1919 through 1923. Beginning in 1924, however, exports declined regularly each year until 1932 (table 11). They remained relatively low up to 1940, although there has been a noticeable increase since then.

Before World War I, more than 90 percent of our exports went to the United Kingdom (fig. 7). Exports to Canada and the Continent of Europe rose during the prohibition period, but they declined again during the 1930's. Exports to Canada rose sharply after 1938, as did those to "other" countries - chiefly Mexico and South American countries which had previously obtained their hops from Germany. The change in destination of exports is reflected in the following data published by the Office of Foreign Agricultural Relations.

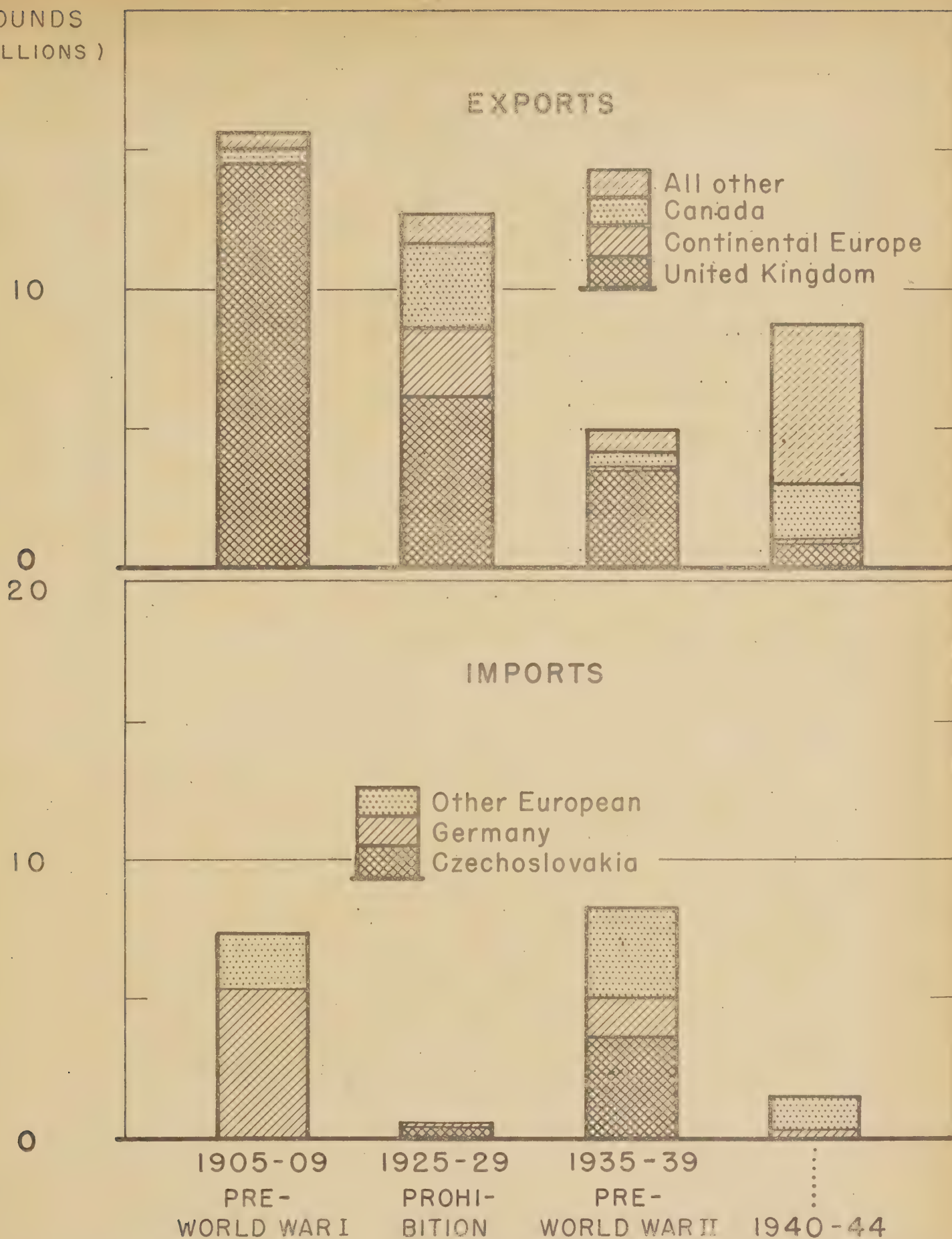
^{2/} On a per capita basis, this is slightly higher than the record of 21 gallons per capita reported in 1914.



* INCLUDING WARTIME PROHIBITION AGAINST USE OF GRAIN FOR ALCOHOLIC BEVERAGES

FIGURE 6.- SUPPLY AND DISPOSITION OF HOPS IN
THE UNITED STATES, 1915 - 47

POUNDS
(MILLIONS)



**FIGURE 7.-DESTINATION OF ANNUAL EXPORTS AND
ORIGIN OF ANNUAL IMPORTS OF HOPS, UNITED STATES,
FOR SELECTED 5-YEAR PERIODS**

Exports of United States hops 1938, 1944, and 1948 crop years

Country	Year 1938	Year 1944 1/	Year 1948 2/
	Pounds	Pounds	Pounds
Europe	156,424	301,923	407,916
United Kingdom	2,400,364	30,187	58,088
Irish Free State	741,778	399,250	30,000
Africa	830	701,939	208,491
Asia and Asia Minor	4,400	-	61,696
Australia and New Zealand ...	155,032	-	657,803
Canada	299,358	3/ 2,063,033	2,574,070
Mexico and Central America ..	289,017	2,404,653	1,319,089
South America	92,649	2,370,600	5,174,310
India and East Indies	18,365	75,327	25,550
Japan	2,510	-	-
Philippine Islands	11,123	-	110,302
Others	964	3/ 339,038	469,002
Totals	4,172,814	3/ 8,685,950	11,096,317

1/ Foreign Crops and Markets, Vol. 51, no. 17, p. 244.

2/ Office of Foreign Agricultural Relations. Unpublished data.

3/ Revised reports since first issuance.

Hops are imported into the United States because many brewers believe that hops from specific countries are essential to the flavor they want in the beer they manufacture. This factor is less important now than it was in the prewar era, and particularly it was less insistent during the war years when foreign hops were not available. Imports have been less than exports in all years except 1934, 1936, 1937, 1938, and 1939 (table 12). Imports were especially low during the 1920's, when they fell to about 1/2-million pounds in some years. With the repeal of the prohibition law, imports rose again to approximately the levels that prevailed before World War I. Imports declined sharply with the outbreak of World War II, in 1939, and by 1942 they had reached an all-time low. The chief sources of imports into the United States are areas included in what was called "Greater Germany" - particularly areas in Bavaria and Czechoslovakia.

Hops are exported from and imported into several countries, and some countries both import and export hops. Of an average annual world production ^{3/}of hops of more than 130 million pounds in the 1925-29 period, between 50 and 60 million pounds were exported from the country where raised. In the 1930-34 period, world production ^{3/} was about 110 million pounds, of which about 40 million were shipped out of the country where raised. Of the world production in 1930-34, nearly 30 percent was raised in the United States, the leading producer; about 22 percent in England and Wales; 19 percent in Czechoslovakia (as then constituted); 15 percent in Germany; and the rest in numerous other countries, chiefly European. During this period, nearly 40 percent of all exports originated from Czechoslovakia, 17 percent from Germany, 13 percent from the United States, roughly 10 percent each from Yugoslavia and Poland, and the remainder from various countries, chiefly European. Of the total imports in this period, Belgium took about 16 percent, Ireland about 13 percent, Germany and France each about 12 percent, the United Kingdom about 11 percent, the United States about 8 percent, and the rest were imported by a long list of countries. These figures give some idea of the chief prewar producing, exporting, and importing areas.

The United States imported 5.7 million pounds during the 1947-48 fiscal period while exports amounted to about 11.1 million pounds. A crucial question arises, therefore, as to the probable volume of United States exports and imports after 1948. The answer hinges on the condition of European hop yards, as well as upon policies in regard to foreign trade. If the major producing districts in Europe are able to turn out a large volume of hops in the next few years, this will be a strong incentive for foreign-trade arrangements that will permit them to move. On the other hand, if the productive capacity of European yards has been sharply reduced, there will be little export from those countries for a few years. The author's conclusion is that it is not unlikely that hops from the United States will be in fairly active demand by South American countries, and perhaps even by some European countries for a year or two. It may be possible to retain for a longer period at least a part of the newly acquired increased demand in Mexico and South America.

It is true that hops were exported from the United States in unusually large volume for 3 or 4 years after World War I. But the demand for these hops was extremely low in the United States because of the prohibition law. Moreover, foreign trade was then much more a matter of private bargaining than it is now; governmental control of foreign trade is now more common. Annual exports from the United States of the general magnitude of 11 to 14 million pounds were made during the 1945-48 period.

^{3/} Excluding the Union of Soviet Socialist Republics in each period.

As far as balancing domestic production of hops with the demand for hops, some imports into the United States must be reckoned with because many brewers have a preference for hops grown in certain foreign countries. They believe that the best beer can be produced when foreign hops are used. As the price of hops is a small factor in the cost of a barrel of beer, there is a consistent demand for some imported hops despite the tariff barrier and the apparent higher net cost per pound. On the whole, however, the volume of such imports will be influenced by the same factors that influence foreign trade in hops between other countries - the volume of beer production in Europe and the recovery of hop production in the chief European producing districts, and foreign trade policies in general. Even if the situation of the late 1930's is not approximated, European countries in general are almost sure to import some hops. Although the foreign trade situation for the longer run is uncertain, the prospects seem to be for a fairly sizable surplus of exports over imports through 1949. After that, the net import-export balance will depend so largely upon the foreign trade policies which may be adopted by various countries that forecasts are extremely hazardous. In view of the great economic and political changes that have taken place in many countries and areas as a result of the war, the pattern of foreign trade in hops could be very different from that of the 1930's.

PRICES OF HOPS

In view of the incompleteness of the statistics and the lack of comparability of available statistics on the supply, disposition, and prices of hops, there is no adequate foundation for a conclusive price study. Several facts are emphasized, however, when the available data are examined.

The precipitous decline in consumption of hops by breweries in 1918 was followed by a rapid decline in price that carried from a wartime peak of 77.6 cents in 1919 to a low point of 8.6 cents per pound of hops in 1922 (fig. 8, table 13). No doubt some of the downward movement was part of the general deflationary condition that hit all farm prices in 1920. On the other hand, the deflation in hop prices was merely furthered by the general movement of farm prices which began 2 years after the initiation of prohibition restrictions. The fluctuations in the United States average annual farm price after 1922 appear to reflect the recovery in farm prices generally that followed World War I, between 1922 and 1929, as well as the deflation that came between 1929 and 1933.

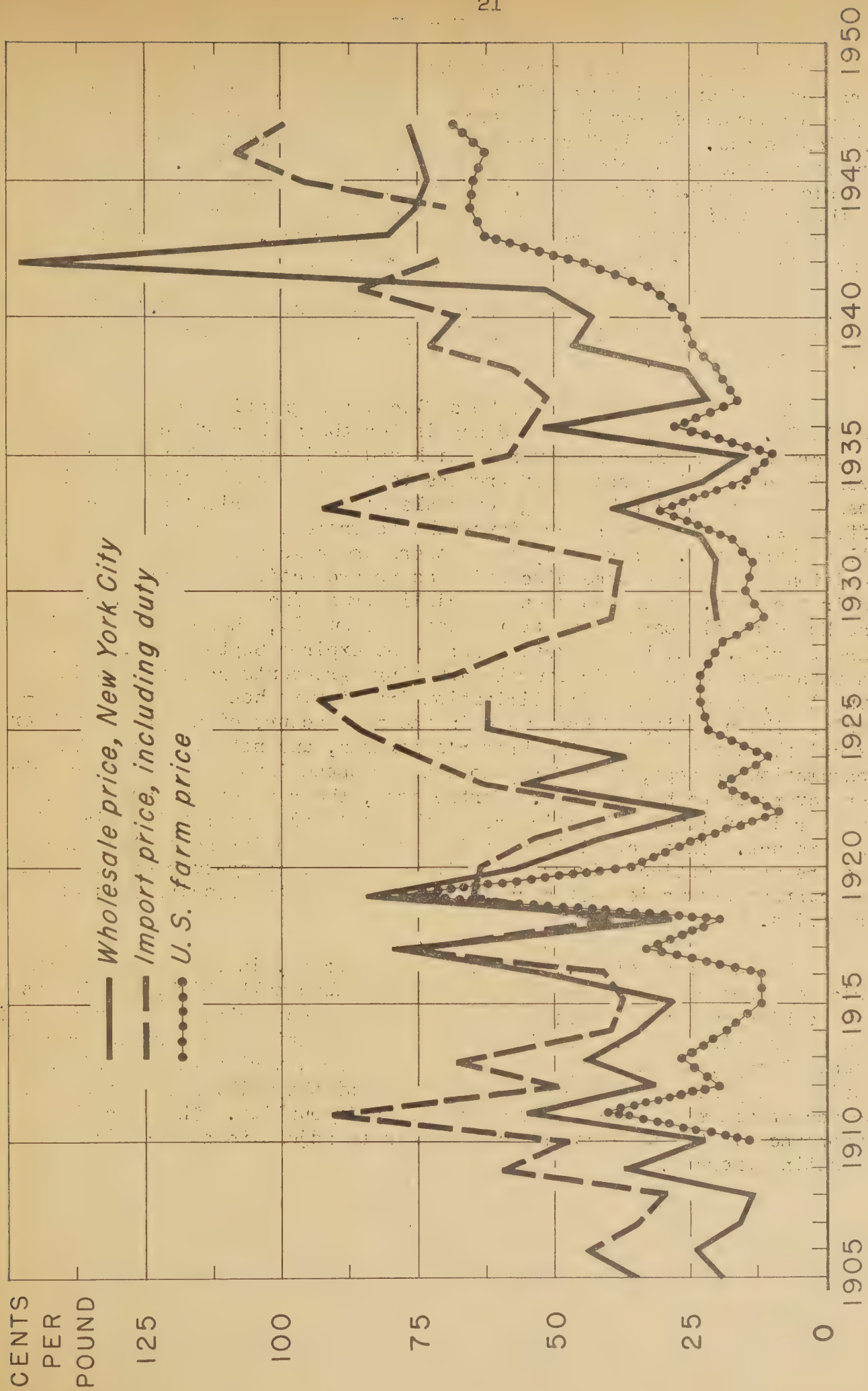


FIGURE 8.-PRICE OF HOPS AT SPECIFIED POINTS, 1905-48

The reports on the stocks of hops for 1937 and thereafter include the carry-over of breweries as well as that of growers. The peak price of 27.4 cents per pound of hops in 1936 occurred with a carry-over of almost 16 million pounds. The 1937 carry-over reached slightly more than 29 million pounds and the farm price declined to 16.2 cents per pound. Later rises in price from 16.2 cents to 64.6 cents, in 1944, took place when stocks in the hands of growers and breweries were declining each year; in 1944 they were only slightly more than 10 million pounds. The seasonal average farm price rose to 68.4 cents per pound during 1947-48 despite the fact that inventories in the hands of brewers was higher than any time since 1937. The carry-over by years since 1944 follows: 1945, 10.4 million pounds; 1946, 16.3 million pounds; 1947, 23.8 million pounds; and 1948, 27.2 million pounds.

The harvested acreage of hops fluctuates greatly from year to year (table 7). In general, the tendency is for the number of acres harvested to decrease when the carry-over is high and to increase when the carry-over is low. This response of growers to a price-supply situation is made possible by the prior knowledge of dealers' and breweries' contract offerings. If prices are not favorable to growers the acreage may not all be harvested. Then, too, the growers are generally in an economic position to exercise some discretion as to production and marketing of their products. This has been especially true since 1938, at which time the Hop Control Board began to regulate the supply, thereby influencing market price. The Hop Marketing Agreement expired September 1, 1945. An amendment to the Agricultural Marketing Agreements Act, passed in June 1945, removed any time limitation from future hop marketing agreements. The quantity of hops used in the manufacture of a barrel of beer is chiefly determined by the brewer's formula, and not by price. The consumption of hops, therefore, does not respond favorably to lower prices nor adversely to high prices. Furthermore, the cost of the hops used in beer is of little significance in the wholesale and retail price of the product. These conditions of inelastic demand for hops place the growers at a distinct disadvantage if the annual carry-over of hops and the current production get much out of line with the requirements of breweries.

The net rise of 40.1 cents, or 164 percent, in the average farm price of hops between 1939 and 1944 appears abnormally high, but it was not so high as dealers were willing to pay had not price controls determined the upper price limit. Despite the very substantial increase in price per pound of hops, the quality of the product sold deteriorated materially during the period of World War II, because of the willingness of buyers to accept almost all hops regardless of their quality. This fact has importance if the hop-growing industry is to adjust to a peacetime marketing program.

Table 7. - Acreage of hops harvested, by States, 1915-48

Year	Washington	Oregon	California	Total three States
	Acres	Acres	Acres	Acres
1915	4,530	20,000	14,350	38,880
1916	4,500	20,000	14,400	38,900
1917	3,500	10,000	11,900	25,400
1918	3,100	8,000	11,000	22,100
1919	2,000	8,000	11,000	21,000
1920	3,000	11,000	12,000	26,000
1921	3,000	12,000	12,000	27,000
1922	2,400	12,000	9,000	23,400
1923	1,890	11,550	5,000	18,440
1924	2,350	12,000	6,000	20,350
1925	2,350	13,000	5,000	20,350
1926	2,400	13,000	5,400	20,800
1927	2,600	16,000	6,000	24,600
1928	3,200	17,000	6,000	26,200
1929	2,900	17,000	4,500	24,400
1930	2,200	14,000	3,300	19,500
1931	2,200	15,500	3,700	21,400
1932	2,500	15,500	4,000	22,000
1933	4,900	19,000	6,400	30,300
1934	6,300	23,000	7,800	37,100
1935	6,000	26,000	7,100	39,100
1936	4,500	21,000	5,500	31,000
1937	5,000	22,300	7,000	34,300
1938	5,000	19,800	6,700	31,500
1939	4,900	19,300	6,800	31,000
1940	6,000	19,600	7,200	32,800
1941	7,200	20,000	7,600	34,800
1942	7,600	19,300	7,700	34,600
1943	7,800	16,500	7,900	32,200
1944	9,700	18,500	8,400	36,600
1945	11,700	19,900	9,100	40,700
1946	11,600	20,000	9,100	40,700
1947	11,700	19,000	9,000	39,700
1948 <u>1/</u>	13,100	17,700	9,200	40,000

1/ Preliminary

Sources: 1915-48. Crop Reporting Board.

Prices for hops were high enough to cause growers to increase production by 10 million pounds between 1939 and 1944. Not only was this increased output utilized, but the available stocks of hops decreased more than 60 percent between 1939 and 1944. These stocks were replenished in 1947 and 1948, which indicates that production is now ahead of demand. Any continued pressure of demand on supply will not continue unless there is (1) an abnormally high increase in beer consumption, (2) an unusually high net export trade in hops, and (3) a material increase in the hops-beer ratio.

Full production from new plantings will not be achieved until 1949 or later. By that time foreign-grown hops should be available at prices below those now prevailing in the domestic market, despite the tariff of 24 cents per pound of hops priced at 50 cents or less per pound and 12 cents on hops priced at more than 50 cents per pound. As the cost of hops is a minor factor in the manufacture of beer, the tariff alone has not succeeded in curtailing the importation of foreign-grown hops to any great extent.

Certain competitive forces in the industry are important as long-run price determinants. These follow:

1. Proper grading of hops is essential if the domestic product is to compete with the foreign-grown product. Brewers can well afford to pay more for clean foreign hops than for poorly graded domestic hops. If American hop growers are to meet foreign competition, they must market hops that are (a) free from leaves and stems, (b) free from disease, (c) relatively unshattered in handling, and (d) properly dried.
2. Many brewers are expressing a preference for hops of lower seed content than has been customary in the past. The effect of seed content on average prices for hops is fairly well indicated by a comparison of average farm prices paid to growers in California, Oregon, and Washington. The acreage of hops in Washington has more than doubled since 1939, and more than two thirds of the 1944 marketing from Washington showed less than 6 percent seed content. This lower seed content in Washington hops accounts in a large measure for the price differential that has favored Washington growers since 1940 (fig. 9).
3. Harvesting and handling methods are in the process of change. Mechanization of the harvesting by the use of field machine pickers is going on in several hop yards. This mechanization has tended to lower unit harvesting and handling costs and to make easier the standardization of product quality.
4. The development and use of uniform standards for grading hops has helped to eliminate some of the apparently unaccountable fluctuations in prices in grower-dealer-brewery transactions. Material progress has been made toward developing uniform grading standards as a result of the research sponsored by the Brewers' Hop Research Institute at the Oregon State College.

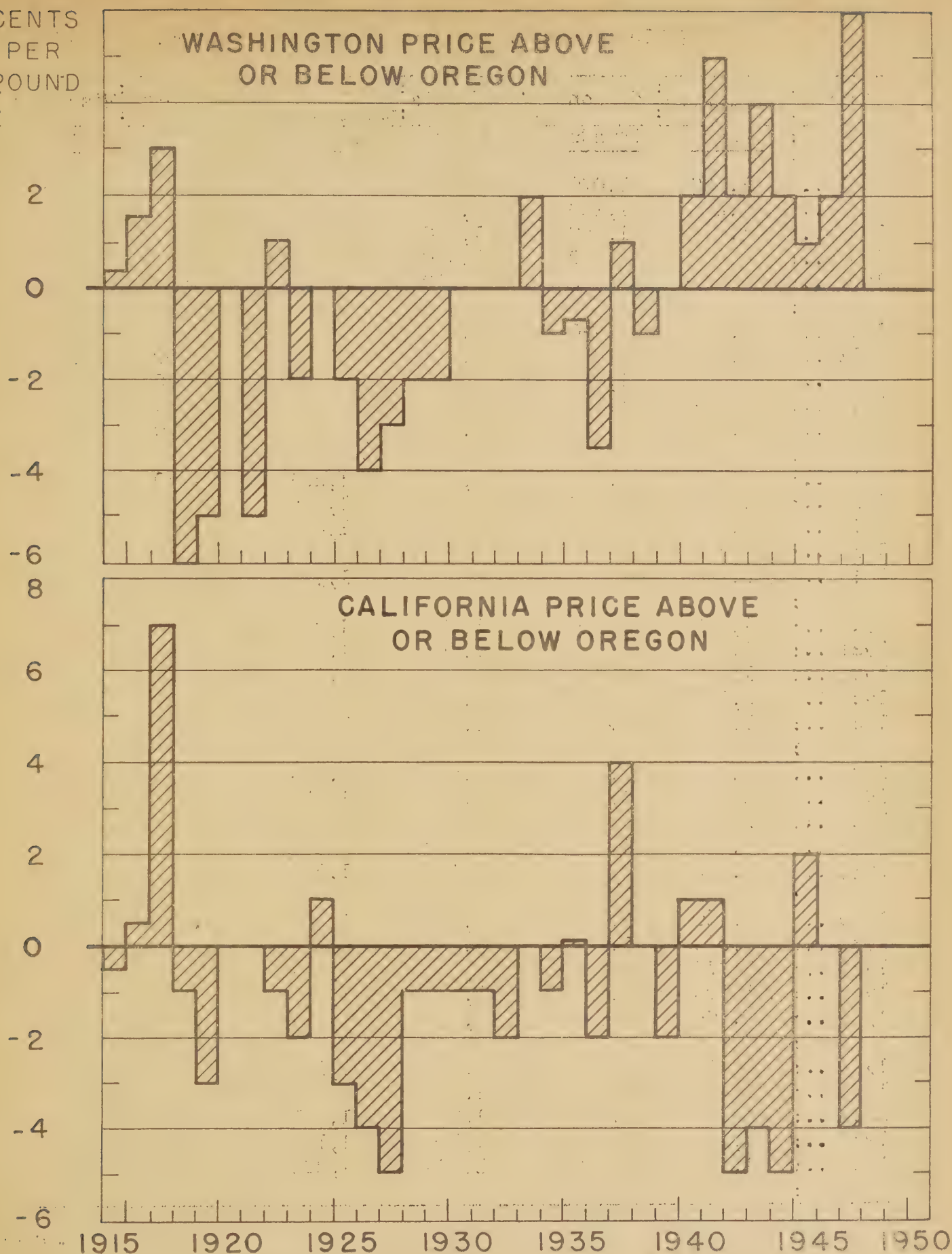
CENTS
PER
POUND

FIGURE 9.-COMPARISONS OF FARM PRICE OF HOPS, WASHINGTON, OREGON, AND CALIFORNIA, 1915-47

Table 8. - Yield of hops per acre by States, 1905-48

Year	Washington	Oregon	California	Total three States	New York	Wisconsin	Total United States
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1905 ...	1,480	1,070	970		545	---	1,005
1906 ...	1,240	1,150	1,275		650	---	1,101
1907 ...	1,425	1,050	1,460		510	---	1,114
1908 ...	1,375	950	1,400		600	---	1,065
1909 ...	1,400	850	1,300		665	400	992
1910 ...	1,370	990	1,550		775	550	1,130
1911 ...	1,300	825	1,300		500	1,000	960
1912 ...	1,450	1,350	1,450		480		1,142
1913 ...	1,615	1,250	1,600		550		1,150
1914 ...	1,480	950	1,700		450		985
1915 ...	1,648	1,050	1,495	1,284	530		1,187
1916 ...	1,515	950	1,547	1,236	500		1,153
1917 ...	1,657	500	1,320	1,044	640		983
1918 ...	1,370	435	1,136	915	330		724
1919 ...	1,340	850	1,650	1,316	690		1,228
1920 ...	1,910	725	1,575	1,254	<u>1/</u> 950		1,224
1921 ...	1,700	770	1,250	1,087			
1922 ...	1,410	800	1,640	1,186			
1923 ...	2,123	722	1,480	1,071			
1924 ...	1,817	1,150	1,600	1,360			
1925 ...	2,116	1,200	1,600	1,404			
1926 ...	2,380	1,300	1,650	1,515			
1927 ...	1,867	994	1,650	1,246			
1928 ...	2,020	1,000	1,580	1,257			
1929 ...	1,750	1,085	2,150	1,360			
1930 ...	1,660	1,025	1,650	1,202			
1931 ...	1,760	1,096	1,500	1,234			
1932 ...	1,775	840	1,650	1,094			
1933 ...	1,600	1,135	1,700	1,330			
1934 ...	1,905	900	1,440	1,184			
1935 ...	1,819	992	1,370	1,188			
1936 ...	1,617	530	1,250	816			
1937 ...	1,757	1,100	1,520	1,281			
1938 ...	1,935	830	1,370	1,120			
1939 ...	1,880	900	1,600	1,208			

- Continued

Table 8. - Yield of hops per acre by States, 1905-48 - Continued

Year	Washington	Oregon	California	Total three States	New York	Wisconsin	Total United States
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1940 ..	1,950	1,035	1,400	1,282			
1941 ..	1,850	840	1,350	1,160			
1942 ..	1,551	680	1,330	1,016			
1943 ..	1,960	880	1,600	1,318			
1944 ..	1,750	925	1,620	1,303			
1945 ..	1,880	1,025	1,580	1,395			1,395
1946 ..	1,700	940	1,610	1,306			1,306
1947 ..	1,740	850	1,510	1,262			1,262
1948 2/	1,730	890	1,500	1,305			1,305

1/ Although New York acreage is not reported subsequent to 1920, a small acreage has continued to exist there.

2/ Preliminary.

Source: Crop Reporting Board.

Hops: Revised Estimates of Acreage, Yield, and Production 1915-41 (Mimeograph). Oct. 1943. New York and United States from Univ. of California - Coll. of Agr. - Agricultural Extension Service. Statistics Presented in Connection with a Proposed Marketing Agreement for Hops Produced in California, Oregon, and Washington, by William C. Ockey, Dallas W. Smythe, and F. R. Wilcox, Jan. 1935, p. 10.

1942-45; U.S. Office of Marketing Services, Hop Market Review, San Francisco, Calif., Jan. 7, 1944, Jan. 5, 1945 and Aug. 3, 1945.

Table 9. - Production of hops by States, 1905-48

Year	Washington	Oregon	California	Total three States	Other	Total United States 1/
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
1905	9,750	22,191	14,235	46,176	9,360	55,536
1906	8,775	23,985	15,520	48,280	12,006	60,286
1907	7,000	23,000	15,000	45,000	9,000	57,510
1908	3,000	16,000	12,000	31,000	8,000	43,900
1909	3,000	15,000	13,000	31,000	9,000	50,697
1910	4,000	18,000	13,000	35,000	9,000	49,634
1911						51,672
1912						53,371
1913						62,899
1914						43,415
1915	7,466	21,000	21,460	49,926	3,060	52,986
1916	6,818	19,000	22,277	48,095	2,500	50,595
1917	5,800	5,000	15,708	26,508	2,880	29,388
1918	4,247	3,480	12,500	20,227	1,254	21,481
1919	2,680	6,800	18,150	27,630	690	28,320
1920	5,730	7,975	18,900	32,605	950	33,555
1921	5,100	9,240	15,000	29,340		29,340
1922	3,384	9,600	14,760	27,744		27,744
1923	4,012	8,339	7,400	19,751		19,751
1924	4,270	13,800	9,600	27,670		27,670
1925	4,973	15,600	8,000	28,573		28,573
1926	5,712	16,900	8,910	31,522		31,522
1927	4,854	15,904	9,900	30,658		30,658
1928	6,464	17,000	9,480	32,944		32,944
1929	5,075	18,445	9,675	33,195		33,195
1930	3,652	14,350	5,445	23,447		23,447
1931	3,872	16,988	5,550	26,410		26,410
1932	4,438	13,020	6,600	24,058		24,058
1933	7,840	21,565	10,880	40,285		40,285
1934	12,002	20,700	11,232	43,934		43,934
1935	10,914	25,792	9,727	46,433		46,433
1936	7,276	11,130	6,875	25,281		25,281
1937	8,785	24,530	10,640	43,955		43,955
1938	9,675	16,434	9,179	35,288		35,288
1939	9,212	17,370	10,880	37,462		37,462

- Continued

Table 9. - Production of hops by States, 1905-48 - Continued

Year	Washington	Oregon	California	Total three States	Other	Total United States ^{1/}
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
1940 ..:	11,700	20,286	10,080	42,066		42,066
1941 ..:	13,320	16,800	10,260	40,380		40,380
1942 ..:	11,788	13,124	10,241	35,153		35,153
1943 ..:	15,288	14,520	12,640	42,448		42,448
1944 ..:	16,975	17,112	13,608	47,695		47,695
1945 ..:	21,996	20,398	14,378	56,772		56,772
1946 ..:	19,720	18,800	14,651	53,171		53,171
1947 ..:	20,358	16,150	13,590	50,098		50,098
1948 ..:	23,056	15,753	11,316	50,125		50,125

^{1/} Includes the following quantities not available for marketing because of economic conditions and the marketing agreement allotments (1,000 pounds): 1935, 5,436; 1937, 4,365; 1938, 3,140; 1939, 2,813.

Source: 1905-14; U. S. Dept. of Agriculture Yearbooks, 1908-16. U. S. totals, 1907-10 obtained from later yearbooks than those in which State figures were given. These later yearbooks give no State figures.
For California only, California Board of Agriculture, Statistical Report 1915, p. 84, California crop, (1,000 pounds): 1905, 13,095; 1906, 15,520; 1907, 16,072; 1908, 13,260; 1909, 12,765; 1910, 13,135; 1911, 16,095; 1912, 21,645; 1913, 21,922; 1914, 20,350.
1915-41; individual States from U. S. Bur. of Agricultural Economics, Crop Reporting Board, Hops: Revised Estimates of Acreage, Yield, and Production 1915-41 (Mimeograph), Oct. 1943. U. S. totals from U.S. Dept. of Agriculture, Agricultural Statistics, 1942, p. 365 and 1944, p. 280
1942-45: U. S. Office of Marketing Services, Hop Market Review, San Francisco, Calif., Jan. 7, 1944, Jan. 5, 1945, and Aug. 3, 1945.

Table 10.- Supply and disposition of hops in the United States, 1905-48

Year	1/ Sept.	2/ Sept.	3/ Sept.	4/ Sept.	5/ Sept.	6/ Sept.	7/ Sept.	8/ Sept.	9/ Sept.	10/ Sept.
	Stocks	Harvest-	Total	Stocks	Total	Exports	Movement	Imports	Domestic supply	Consumption
	1/ Sept.	2/ Sept.	3/ Sept.	4/ Sept.	5/ Sept.	6/ Sept.	7/ Sept.	8/ Sept.	9/ Sept.	10/ Sept.
	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	pounds	pounds	pounds	pounds	pounds	pounds	pounds	pounds	pounds	pounds
1905-06		55,536				13,027		10,114		41,620
1906-07		60,286				16,810		6,212		44,295
1907-08		57,510				22,920		8,493		42,388
1908-09		43,900				10,447		7,387		40,814
1909-10		50,697				10,589		3,201		43,294
1910-11		49,634				13,477		8,520		45,069
1911-12		51,672				11,941		2,993		42,437
1912-13		53,371				17,758		8,527		44,238
1913-14		62,899				23,902		5,418		43,988
1914-15		43,415				3,372		11,545		38,839
1915-16		52,986				19,592		706		37,452
1916-17		50,595				14,252		201		41,959
1917-18		29,388				3,654		121		33,481
1918-19		21,481				9,545		4/		13,925
1919-20		28,320				30,266		3,876		5,441
1920-21		33,555				20,818		3,671		5,989
1921-22		29,340				19,144		975		4,453
1922-23		27,744				15,659		1,368		4,556
1923-24		19,751				19,007		574		3,815
1924-25		27,670				16,032		482		5/ 3,256
1925-26		28,573				14,392		569		5/ 3,426
1926-27		31,522				13,480		471		5/ 3,149
1927-28		30,658				11,536		733		5/ 3,071
1928-29		32,944				8,854		688		2,735
1929-30		33,195				6,725		6/ 944		2,627

Continued -

Table 10.- Supply and disposition of hops in the United States, 1905-48 - Continued

Year	Stocks Sept. 1/	Harvested Sept. 1/	Total supply	Stocks following Sept. 1/	Total movement	Exports to growers domestic	Movement from growers to domestic	Imports	Domestic supply excluding trade carry-in	Consumption by breweries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
1930-31:	6,512	23,447	29,959	2,328	27,631	5,552	22,079	1,039	23,118	2,197
1931-32:	2,328	26,410	28,738	2,536	26,202	3,801	22,401	1,234	23,695	1,841
1932-33:	2,536	24,058	26,594	1,789	24,805	2,444	22,361	4,962	27,323	7,767
1933-34:	1,789	40,285	42,074	8,658	33,416	7,700	25,716	7/ 5,761	31,477	26,235
1934-35:	8,658	43,934	52,592	16,061	36,531	6,772	29,759	5,257	35,016	31,773
1935-36:	16,061	46,433	62,494	15,825	46,669	6,184	40,485	6/ 6,535	47,020	33,316
1936-37:	15,825	25,281	41,106	29,294	11,812	2,713	9,093	11,026	20,119	37,005
1937-38:	29,294	43,355	73,249	25,173	48,076	5,784	42,292	9,189	51,481	34,875
1938-39:	25,173	35,288	60,461	27,069	33,392	4,183	29,209	8,053	37,262	32,746
1939-40:	27,069	37,462	64,531	22,124	42,407	7,991	34,416	6,814	41,230	31,927
1940-41:	22,124	42,066	64,190	20,008	44,182	10,030	34,152	3,736	37,888	31,155
1941-42:	20,008	40,380	60,388	18,892	41,496	3,459	32,037	154	32,191	34,512
1942-43:	18,892	35,153	54,045	10,735	43,310	8,673	34,637	111	34,748	34,833
1943-44:	10,735	42,448	53,183	10,110	43,073	6,311	36,762	73	36,835	36,515
1944-45:	10,110	47,695	57,805	10,389	47,416	8,685	38,731	13	38,744	37,239
1945-46:	10,389	56,772	67,161	15,132	52,029	14,288	37,741	3,859	41,600	36,834
1946-47:	15,132	53,171	68,303	23,770	44,533	12,243	32,290	4,126	36,416	42,293
1947-48:	23,770	50,098	73,868	27,220	46,648	11,071	35,577	5,698	41,275	40,973
1948-49:	27,220	52,216	79,436							

Continued -

See next page for footnotes.

Table 10.- Supply and disposition of hops in the United States, 1905-48 - Continued

- 1/ Sept. to Aug. year except column 10 which is July to June year.
- 2/ Prior to 1937, the Sept. 1 stocks included only those in growers' hands; from 1937 to date, stocks in dealers' hands and in brewers' hands are also included and these have greatly exceeded the growers' stocks. On Sept. 1, 1943, no stocks were reported in hands of growers.
- 3/ 1920 to 1931 represents hops used to make cereal beverages containing less than 0.5 percent of alcohol by volume; 1932 includes 867,057 pounds of hops used to make cereal beverages containing less than 0.5 percent of alcohol by volume and 6,900,263 pounds fermented malt liquor containing not more than 3.2 percent alcohol by weight; 1933 to date, used for fermented liquor.
- 4/ Less than 500 pounds.
- 5/ Not including 57,936 pounds in 1924, 71,508 pounds in 1925, 960 pounds in 1926, and 6,294 pounds in 1927 used in the manufacture of distilled spirits.
- 6/ Includes hop extract and lupulin, 1930-35.
- 7/ Beginning 1933 imports for consumption.

Sources:

- Col. 1: 1920-21 to 1928-29: U. S. Dept. of Agriculture, Agricultural Adjustment Administration, Division of Marketing and Marketing Agreements, Preliminary Economic Statement Relating to Hops Produced in Oregon, California, and Washington, June 1938, p. 6. 1929-30 to 1943-44; U. S. Dept. of Agriculture, Agricultural Statistics, 1944, p. 280. 1944-45; U. S. Office of Marketing Services, Hop Market Review, San Francisco, Aug. 3, 1945.
- Col. 2: From table 7.
- Col. 3: Col. 1 plus col. 2.
- Col. 4: Same as col. 1.
- Col. 5: Col. 3 minus col. 4.
- Col. 6 and col. 8: 1905-06 to 1909-10 are July-June years, from U. S. Dept. of Agriculture, Monthly Crop Report, Nov. 1915, p. 75. 1910-11 to 1939-40; U. S. Dept. of Agriculture, Agricultural Statistics, 1942, p. 365, and 1944, p. 280. 1940-41 to 1943-44; U. S. Office of Marketing Services, Hop Market Review, San Francisco, Aug. 3, 1945.
- Col. 7: Col. 5 minus col. 6.
- Col. 9: Col. 7 plus col. 8.
- Col. 10: 1905-06 to 1909-10; U. S. Dept. of Agriculture, Monthly Crop Report, Nov. 1915, p. 75. 1910-11 to 1933-34; U. S. Dept. of Agriculture, Agricultural Statistics, 1942, p. 365, and 1944, p. 280. 1934-35 to 1944-45; U. S. Office of Marketing Services, Hop Market Review, San Francisco, July 6, 1945, Oct. 12, 1948.

Table 11.- Exports of hops from the United States, by country of destination,
1905-47

Year 1/	United Kingdom :	Continental Europe :	Canada :	All other :	Total
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
1905	13,943	3	438	475	14,859
1906	11,948	4	380	695	13,027
1907	15,565	30	571	644	16,810
1908	21,748	32	681	459	22,920
1909	9,219	--	702	526	10,447
1910	9,530	20	634	405	10,589
1911	11,782	10	635	678	13,105
1912	10,463	35	1,326	367	12,191
1913	15,409	28	1,036	1,118	17,591
1914	22,220	154	1,213	676	24,263
1915	13,824	19	1,071	1,296	16,210
1916	19,703	91	626	1,990	22,410
1917	824	162	801	3,038	4,825
1918	76	72	749	2,773	3,670
1919	12,524	1,552	2,493	4,229	20,798
1920	21,422	29	1,969	2,204	25,624
1921	13,376	672	2,960	1,452	18,460
1922	10,586	1,233	1,867	1,196	14,882
1923	6,246	8,692	4,008	1,095	20,041
1924	5,116	7,672	2,762	1,841	17,391
1925	8,223	6,754	4,118	1,560	20,655
1926	5,015	3,814	2,757	1,247	12,833
1927	8,276	1,587	3,132	1,124	14,119
1928	4,299	153	2,777	757	7,986
1929	4,643	148	2,461	425	7,677
1930	4,758	162	2,507	213	7,640
1931	3,094	64	508	131	3,797
1932	2,566	57	270	114	3,007
1933	5,452	256	668	351	6,727
1934	4,520	338	825	320	6,003
1935	4,541	303	907	470	6,221
1936	2,539	79	473	333	3,424
1937	4,852	87	388	341	5,668
1938	3,748	127	519	428	4,822
1939	1,734	154	292	2,502	4,682

- Continued

Table 11. -Exports of hops from the United States, by country of destination,
1905-47 - Continued

Year <u>1</u> /	United Kingdom	Continental Europe	Canada	All other	Total
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
1940	3,251	139	1,192	5,067	9,649
1941	476	93	1,942	7,332	9,843
1942	364	124	3,544	4,508	8,540
1943 <u>2</u> /.....	---	10	1,327	5,718	7,055
1944 <u>2</u> /	62	568	2,057	5,837	8,524
1945 <u>2</u> /	71	1,953	3,168	9,206	14,398
1946 <u>2</u> /	5	696	3,111	8,347	12,159
1947 <u>2</u> /	---	515	2,431	8,150	11,096

1/ Years ended June 30, 1910-17. Calendar years thereafter.

2/ Year ended June 30.

Sources: 1915-32; Univ. of California - Coll. of Agriculture -
Agricultural Extension Service, Statistics Presented in Connection
with a Proposed Marketing Agreement for Hops Produced in California,
Oregon and Washington, by William C. Ockey, Dallas W. Smythe, and
F. R. Wilcox, Jan. 1935, p. 16.
1905-14 and 1933-42; U.S. Dept. of Commerce, Foreign Commerce and
Navigation of the U.S. annual issues.

Table 12.- Imports of hops into the United States by country of origin,
1905-47

Year	Czecho- slovakia	Germany	Other European	All other	Total
	Pounds	Pounds	Pounds	Pounds	Pounds
1905		3,527,303	811,847	229	4,339,379
1906		7,900,735	2,201,141	12,113	10,113,989
1907		4,554,883	1,657,003	7	6,211,893
1908		5,912,660	2,578,531	2,074	8,493,265
1909		4,937,580	2,445,673	3,321	7,386,574
1910		2,059,484	1,141,027	49	3,200,560
1911		5,249,130	3,300,764	7,637	8,557,531
1912		1,770,620	1,219,205	1,300	2,991,125
1913		5,044,424	3,449,707	13	8,494,144
1914		2,868,370	2,500,723	12,932	5,382,025
1915		5,370,388	6,277,123	3,821	11,651,332
1916		358,564	317,140	---	675,704
1917		14,000	221,064	1,785	236,849
1918		---	121,211	87	121,288
1919		153,379	314,054	---	467,433
1920	1,705,353	1,374,647	2,792,430	77,069	5,949,499
1921	367,820	812,196	420,367	28,546	1,628,929
1922	723,572	456,950	19,041	1,380	1,200,943
1923	632,555	327,993	13,790	43,527	1,017,865
1924	327,719	50,125	26,685	1,721	406,250
1925	404,643	99,341	73,773	14,701	592,458
1926	313,051	211,268	42,874	551	567,744
1927	324,629	213,894	15,590	---	554,113
1928	317,810	186,223	75,480	1,472	580,985
1929	376,870	367,571	7,636	12,553	764,630
1930	3/. 451,218	622,547	15,380	9,498	1,098,643
1931	3/. 291,854	772,107	12,478	900	1,077,339
1932	3/. 322,694	922,693	53,835	557	1,299,779
1933	3/. 1,834,205	3,613,639	421,750	67,912	5,937,506
1934	2,195,161	3,257,885	647,988	3,939	6,104,973
1935	2,523,932	1,853,653	867,723	2,900	5,248,208
1936	4,026,875	2,344,297	2,521,889	20,717	8,913,778
1937	5,369,679	1,731,519	2,907,613	11,957	10,020,768
1938	5,099,455	348,971	3,773,351	379	9,222,156
1939	1,141,617	1,038,627	5,940,353	69,622	8,190,219

Continued -

Table 12.- Imports of hops into the United States by country of origin,
1905-47 - Continued

Year <u>1/</u>	Czecho- slovakia <u>2/</u>	Germany	Other European	All other	Total
	Pounds	Pounds	Pounds	Pounds	Pounds
1940	---	1,250,192	2,347,237	13,418	3,610,847
1941	---	---	3,535,060	27,614	3,562,674
1942	10,482	---	120,613	91,017	222,112
1943 <u>4/</u> ..	---	---	---	73	73
1944 <u>4/</u> ..	---	---	---	13	13
1945 <u>4/</u> ..	1,520,297	1,891,661	333,440	25,273	3,770,671
1946 <u>4/</u> ..	3,104,891	755,815	188,794	24,135	4,073,635
1947 <u>4/</u> ..	2,407,961	2,722,355	443,374	7,061	5,580,751

1/ Years ended June 30, 1910-17. Calendar years thereafter.

2/ Included in "Other European" countries, 1905-19.

3/ Includes hop extract and lupulin 1930-33.

4/ Year Sept. 1 to Aug. 31.

Sources: 1910-31; U. S. Dept. of Agriculture, Agricultural Adjustment Administration - Division of Marketing and Marketing Agreements, Preliminary Economic Statement Relating to Hops Produced in Oregon, California, and Washington, June 1938, Table VIII. 1905-09 and 1932-42; U. S. Dept. of Commerce, Foreign Commerce and Navigation of the United States, annual issues. 1943-47; U. S. Dept. of Commerce, Foreign Commerce and Navigation of the U. S.

Table 13.- Price per pound of hops at specified points, and tariffs, 1905-47

Year	Farm price 1/		Wholesale		Import		Tariff	Import
	Washington:	Oregon	California:	United States	Oct.-Nov. averages	price without duty 4/		
	(1)	(2)	(3)	(4)	(5)	(6)	(8)	(9)
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1905					19.3	13.0	12	35.5
1906					23.8	15.8	12	43.6
1907					16.0	10.5	12	34.1
1908					13.5	10.0	12	30.1
1909		5/ 22.6			36.8	26.5	12	58.3
1910		5/ 13.9			22.3	16.3	16	47.6
1911		5/ 41.8		6/ 14.0	54.8	47.3	16	90.6
1912		5/ 18.3		6/ 40.5	31.8	22.8	16	49.6
1913		5/ 22.8		6/ 19.8	44.0	27.0	16	67.8
1914		5/ 14.3		6/ 26.4	34.8	13.3	16	39.8
1915								
1916	11.3	11.0	10.5	11.7	29.0	12.8	16	37.4
1917	11.5	10.0	10.5	12.0	52.5	11.8	16	41.0
1918	27.0	24.0	31.0	33.3	79.0	31.2	16	75.7
1919	15.0	21.0	20.0	19.3	28.2	--	16	39.4
1919	75.0	80.0	77.0	77.6	85.9	81.2	16	64.8
1920								
1920	35.0	35.0	35.0	35.7	57.5	57.1	16	63.5
1921	20.0	25.0	25.0	24.1	42.3	19.5	16	54.2
1922	10.0	9.0	8.0	8.6	23.0	12.5	16	35.8
1923	18.0	20.0	18.0	18.8	55.8	27.8	24	62.8
1924	10.0	10.0	11.0	10.3	37.1	14.2	24	74.3
1925								
1925	21.0	23.0	20.0	21.8	62.4	13.5	24	85.9
1926	21.0	25.0	21.0	23.1	62.1	25.0	24	92.8
1927	22.0	25.0	20.0	22.3	--	22.5	24	68.3
1928	18.0	20.0	19.0	19.3	--	22.5	24	54.9
1929	10.0	12.0	11.0	11.4	19.7	17.2	24	39.7

Table 13.- Price per pound of hops at specified points, and tariffs, 1905-47 - Continued

Year	Farm price 1/			Wholesale			Import price without duty 4/	Tariff rate	Import price including duty
	Washington	Oregon	California	United States	Oct.-Nov. averages	Chicago, 1905-13			
					New York prime to choice 2/				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1930	15.0	15.0	14.0	14.8	20.5	12.0	14.8	24	38.8
1931	14.0	14.0	13.0	13.8	20.1	13.0	13.5	24	37.5
1932	18.0	18.0	16.0	17.5	22.9	12.8	37.0	24	61.0
1933	32.0	30.0	30.0	30.4	39.1	34.6	68.0	24	92.0
1934	14.0	15.0	14.0	14.5	22.5	22.5	54.0	24	78.0
1935	9.2	9.9	10.0	9.8	14.9	12.4	34.4	24	58.4
1936	25.5	29.0	27.0	27.4	51.8	33.6	30.6	24	54.6
1937	16.0	15.0	19.0	16.2	21.6	13.1	27.7	24	51.7
1938	19.0	20.0	20.0	19.7	25.4	16.2	32.9	24	56.9
1939	25.0	25.0	23.0	24.5	46.7	26.0	48.1	24	72.1
1940	28.0	26.0	27.0	26.8	43.1		43.4	24	67.4
1941	35.0	30.0	31.0	31.9	51.2		61.6	24	85.6
1942	48.0	46.0	41.0	45.2	147.7		47.7	24	71.7
1943	66.0	62.0	58.0	62.2	80.0		--	24	--
1944	68.0	66.0	61.0	65.3	75.0		46.1	24	70.1
1945	65.0	64.0	66.0	64.9	73.0		71.5	24	95.5
1946	64.0	62.0	62.0	62.7	74.8		83.1	24	107.1
1947	73.0	67.0	63.0	68.4	76.2		75.6	24	99.6

Continued -

Table 13.- Price per pound of hops at specified points, and tariffs, 1905-47 - Continued

- 1/ Farm price of Dec. 1, for years through 1931. Season average price thereafter.
- 2/ 1933-38 prices include "fair to prime," "medium to prime," and "common to prime," as well as "choice."
- 3/ 1939-44 prices include "clusters," "seedless," and "semi-seedless."
- 3/ Old and new crop.
- 4/ July 1 to June 30.
- 5/ Weighted annual average prices paid growers; weights: 75 percent for the months of Sept., Oct., and Nov.; 15 percent for Dec., Jan., and Feb.; 10 percent for Mar., Apr., and May.
- 6/ Average farm price for months of Sept.-Dec., 1910-14.
- 7/ Estimate.

Sources: Col. 1 through 4: 1909-33; Univ. of California - Coll. of Agriculture - Agricultural Extension Service. Statistics presented in Connection with a Proposed Marketing Agreement for Hops Produced in California, Oregon, and Washington, by William C. Ockey, Dallas W. Smythe, and F. R. Wilcox, Jan. 1935, p. 17. 1934-36; U. S. Dept. of Agriculture Yearbooks of Agriculture, and Agricultural Statistics, annuals. 1937-41; U. S. Office of Marketing Services, Hop Market Review, San Francisco, Calif., Oct. 15, 1943. 1942; U. S. Dept. of Agriculture, Agricultural Statistics 1944, p. 281. 1943-44; U. S. Bur. of Agricultural Economics, Season Average Prices and Value of Production, 1943 and 1944, p. 11.

Col. 5 and 6: 1905-29; Agricultural Experiment Station, Oregon State Agricultural College, An Economic Study of the Hop Industry in Oregon, Station Bul. 288, June 1931, p. 76.

1930-32; University of California - College of Agriculture - Agricultural Extension Service, Statistics Presented in Connection with a Proposed Marketing Agreement for Hops Produced in California, Oregon, and Washington, by William C. Ockey, Dallas W. Smythe, and F. R. Wilcox, Jan. 1935, p. 19. 1934-44; New York prices - Producers Price Current, New York. San Francisco prices - Daily Commercial News, San Francisco (not quoted since 1939).

Col. 7: 1905-29; same as columns 5 and 6. 1930-40; U. S. Bur. of Foreign and Domestic Commerce, Monthly Summary of Foreign Commerce of the U. S., June and Dec. issues. Computed from total value and net weight figures. 1942-43; U. S. Office of Foreign Agricultural Relations, Foreign Crops and Markets, Monthly Supplement, Aug. 21, 1943. 1944-47; Computed from primary data - Statistics Division, Office of Foreign Agricultural Relations.

Col. 8: Comparison of the Tariff Acts of 1897, 1909, 1913, and 1922.

Col. 9: Col. 7 plus col. 8.